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EXAMINER

REPKO, JASON MICHAEL

ART UNIT PAPER NUMBER

2628

DATE MAILED: 06/06/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/763,222

Applicant(s)

KOTAKE ET AL.

Examiner

Jason M. Repko

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _____ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on _____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 January 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 5/14
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Specification

1. Applicant is reminded of the proper content of an abstract of the disclosure.

A patent abstract is a concise statement of the technical disclosure of the patent and should include that which is new in the art to which the invention pertains. If the patent is of a basic nature, the entire technical disclosure may be new in the art, and the abstract should be directed to the entire disclosure. If the patent is in the nature of an improvement in an old apparatus, process, product, or composition, the abstract should include the technical disclosure of the improvement. In certain patents, particularly those for compounds and compositions, wherein the process for making and/or the use thereof are not obvious, the abstract should set forth a process for making and/or use thereof. If the new technical disclosure involves modifications or alternatives, the abstract should mention by way of example the preferred modification or alternative.

The abstract should not refer to purported merits or speculative applications of the invention and should not compare the invention with the prior art.

Where applicable, the abstract should include the following:

- (1) if a machine or apparatus, its organization and operation;
- (2) if an article, its method of making;
- (3) if a chemical compound, its identity and use;
- (4) if a mixture, its ingredients;
- (5) if a process, the steps.

Extensive mechanical and design details of apparatus should not be given.

2. **The abstract of the disclosure is objected to because the abstract refers to purported merits: "...synthesized images can be displayed with less work and time." Correction is required. See MPEP § 608.01(b).**

3. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: Method and apparatus for annotating panoramic image-based walkthroughs.

Drawings

4. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: C4 (FIG. 13). Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 101

5. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

6. Claims 1-12 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

7. Claim 6 and 11 recites a computer program not technologically embodied to enable the functionality to be realized. Computer programs, *per se*, are not in one of the statutory categories of invention. Functional descriptive material claimed in combination with an appropriate computer readable medium to enable the functionality to be realized is patent eligible subject

matter if it is capable of producing a useful, concrete and tangible result when used in the computer system. See MPEP § 2106 with regard to computer programs.

8. Claims 1-5 and 7-10 appear to be to an abstract idea rather than a practical application of the idea. Claims 1-5 and 7-10 does not result in a physical transformation nor does it appear to provide a useful, concrete and tangible result. Specifically, it does not appear to produce a tangible result because merely computing the positions of annotations and synthesizing images are nothing more than thoughts or computations within a processor. It fails to use or make available for use the result of image synthesis to enable its functionality and usefulness to be realized. Additionally, the asserted practical application in the specification of information processing is reproducing the synthesized image on a display unit. The practical application is not explicitly recited in the claims nor does it flow inherently therefrom.

9. Claim 12 preempts an abstract idea. A claim may not preempt every substantial practical application of an abstract idea, law of nature or natural phenomena because it would in practical effect be a patent on the judicial exceptions itself.

10. To expedite a complete examination of the instant application, the claims rejected under 35 U.S.C. 101 as non-statutory subject matter are further rejected as set forth below in anticipation of applicant amending the claims to place them within the four categories of invention.

Claim Rejections - 35 USC § 102

11. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

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(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

12. Claims 1, 3, 4, 6, 7, 11, and 12 are rejected under 35 U.S.C. 102(b) as being anticipated by Masakatsu Kourogi, Takeshi Kurata, Katsuhiko Sakaue, and Yoichi Muraoka, "A panorama-based technique for annotation overlay and its real time implementation," July 30, 2000, Proceedings of IEEE International Conference on Multimedia and Expo, p. 657-660 (herein referred to as "Kourogi et al").

13. With regard to claim 1, Kourogi et al discloses "an information processing method comprising:

- a. a viewpoint position/sight line direction determination step of determining a viewpoint position and a sight line direction on a map (*2nd paragraph of section 2: "The referred panoramic image will be switched if necessary as the camera moves around...By tracking which panorama is referred, we can also estimate the position and trajectory of the user. "; Figure 8 shows an Estimation of the user's position; Figure 9 shows Estimation of the user's orientation; Figure 2 shows a map);*
- b. an annotation display position determination step of determining an annotation display position of an object (*Abstract: "It finds image alignment parameters between an input frame and the panoramic image and then maps the positions of annotations from the panoramic image to the input frame and displays the input frame overlaid with those annotations."*), from the position of said object on the map determined based on observation directions of said object in plural panoramic images, the viewpoint position, and the sight line direction (*Figure 2 shows "the panoramic image used is switched while the user moves"*); and

- c. a synthesis step of synthesizing an annotation image to the annotation display position on an actually taken image corresponding to the viewpoint position" (*Figure 7 shows actually taken images overlaid with annotations; 1st paragraph of section 3.3: "In the experiments the user moved along the path $A \rightarrow B \rightarrow C \rightarrow D$ (Figure 5). The output video frames overlaid with annotations are shown in Figure 7, and the user's estimated position and orientation are shown in Figure 8 and 9"*).
14. With regard to claim 3, Kourogi et al discloses "said annotation display position determination step determines the annotation display position of the panoramic image located between said plural panoramic images, by using the determined position of the object on the map" (*2nd paragraph of section 2: "The referred panoramic image will be switched if necessary as the camera moves around. The neighborhood relationship between panoramas are given to enable the switching to occur."; Figure 2 shows annotations for Panoramic image at point B, between panoramic images at point A and C*). One of ordinary skill in the art would recognize the neighborhood relationships are analogous to the position of the object on the map from Figures 2 and 5.
15. With regard to claim 4, Kourogi et al discloses "the determined annotation display position can be manually adjusted" (*1st paragraph of section 2: "Our approach uses a panoramic image to which annotations are manually attached as the source of information."*).
16. Claim 6 recites the limitations of claim 1 as a "control program for causing a computer to execute a information processing method." Kourgoi et al shows the limitations recited in claim 1, and a "control program for causing a computer to execute a information processing method"

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(section 3: "*We implemented our method as software running on a PC cluster and evaluated it in experiments...* ").

17. With regard to claim 7, Kouroggi et al discloses "an information processing method, used in an image reproduction apparatus for achieving walk-through in a virtual space represented by using an actually taken image, of synthesizing an annotation image to the actually taken image, said method comprising the steps of:

- d. setting an annotation display position in each of the plural actually taken images (*2nd paragraph of section 1: "The proposed method uses (1) a set of panoramic images acquired at various points in the environment, (2) annotations attached to the panoramas and (3) neighborhood relationships between panoramas as prior knowledge about the environment. "*);
- e. calculating an annotation display position to another actually taken image located between the plural actually taken images, by using the annotation display positions respectively set in the plural actually taken images (*1st paragraph of section 2: "Our approach uses a panoramic image to which annotations are manually attached as the source of information. When an input frame is given, it is aligned with the referred panoramic image. Then, we can map the positions of annotations from the panorama to the frame... "*); and
- f. synthesizing the annotation image to the actually taken image on the basis of the calculated annotation display position (*1st paragraph of section 2: " Then, we can map the positions of annotations from the panorama to the frame, and thus can create the frame overlaid with the annotations as shown in Figure 1. "*).

18. Claim 11 recites the limitations of claim 7 as a “control program for causing a computer to execute a information processing method.” Kourgoi et al shows the limitations recited in claim 7, and a “control program for causing a computer to execute a information processing method” (*section 3: “We implemented our method as software running on a PC cluster and evaluated it in experiments...”*).

19. Claim 12 recites the limitations of claim 1 as a “an image reproduction apparatus.” Kourgoi et al shows the limitations recited in claim 1, and “an image reproduction apparatus” (*section 3: “We implemented our method as software running on a PC cluster and evaluated it in experiments which a user was equipped with a wearable display, a wearable camera, and a wearable computer.”*).

Claim Rejections - 35 USC § 103

20. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

21. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

22. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

23. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kourogi et al in view of U.S. Patent No. 6,563,529 to Jongerius.

24. With regard to claim 2, Kourogi et al discloses "a two-dimensional map" in Figure 2 and Figure 5. Kourogi et al does not disclose the map is an image. Jongerius discloses a panoramic image from a viewpoint on a given map displayed along with an image of the two-dimensional map image (*Figure 4; lines 17-22 of column 5: "As will be explained, detailed field of view 40 shows a new area of the panoramic view of FIG. 1 slightly to the left of the view of FIG. 2, while map 38 shows a new highlighted view area 36, rotated slightly counter-clockwise (CCW) from view area 34 of FIG. 2."*).

25. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to incorporate a two-dimensional map image as disclosed by Jongerius in the method and system disclosed by Kourogi et al. The motivation for doing so would have been to provide the user with a better understanding of the area being viewed. Therefore, it would have been obvious to combine Kourogi et al with Jongerius to obtain the invention specified in claim 2.

26. **Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kourogi et al in view of U.S. Patent No. 6,563,529 to Jongerius and in further view of U.S. Patent No. 6,392,658 to Oura.**

27. With regard to claim 5, Kourogi et al discloses the limitations recited in parent claim 1. Furthermore, Kourogi et al discloses determining an "observation direction of the object" in Figures 8 and 9 and a two-dimensional map. However, Kourogi et al does not disclose "a graphical user interface including a map display portion." Jongerius discloses "a graphical user interface including a map display portion and a panoramic image display portion is provided (*Figure 4; lines 17-22 of column 5: "As will be explained, detailed field of view 40 shows a new area of the panoramic view of FIG. 1 slightly to the left of the view of FIG. 2, while map 38 shows a new highlighted view area 36, rotated slightly counter-clockwise (CCW) from view area 34 of FIG. 2."*), said plural panoramic images are selected by using the map display portion (*lines 46-47 of column 2: "...any change in the map image is immediately reflected in the detailed image."*).

28. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to incorporate a two-dimensional map image as disclosed by Jongerius in the method and system disclosed by Kourogi et al. The motivation for doing so would have been to provide the user with a better understanding of the area being viewed.

29. Neither Kourgoi et al nor Jonerius disclose "the observation direction of the object is designated on the selected panoramic image displayed on the panoramic image display portion."

30. Oura discloses "the observation direction of the object is designated on the selected panoramic image displayed on the panoramic image display portion" (*Figure 6 shows two views*

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of the panoramic image: the top image uses a frame to indicate the observation direction of the viewer depicted in the lower images; lines 21-23 of column 5: "A part of the whole picture is framed. The framed region is enlarged and displayed as a partial picture.").

31. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to designate the observation direction on the panoramic image display portion as suggested by Oura in the method and system disclosed by the combination of Kourogi et al and Jongerius. The motivation for doing so would have been to provide the user with a better understanding of the location of the current view within the available panoramic image data. Therefore, it would have been obvious to combine Kourogi et al and Jongerius with Oura to obtain the invention specified in claim 5.

32. **Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kourogi et al in view of Reid Harmon, Walter Patterson, William Ribarsky and Jay Bolter, "The Virtual Annotation System," March 30, 1996, Proceedings of the 1996 Virtual Reality Annual International Symposium, p. 239-245 (herein referred to as "Harmon").**

33. With regard to claim 8, Kourogi et al discloses "the setting of the annotation display position in each of the plural actually taken images is performed according to a user's manual instruction" (*1st paragraph of section 2: "Our approach uses a panoramic image to which annotations are manually attached as the source of information."*). Kourogi et al does not expressly disclose "and the calculated annotation display position can be adjusted based on a user's manual instruction." However, Harmon discloses "the calculated annotation display position can be adjusted based on a user's manual instruction" (*2nd paragraph of section "Our annotation system": "When an annotation is made for an object, an annotation icon is created*

and placed in the VE, and a line connects the icon to the object...If an icon of this type is moved, the system saves its new position and adjusts the line to the annotated object accordingly."

34. Kourogi et al and Harmon are analogous art because they are from the same field of endeavor and problem solving area: annotating virtual environments. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to allow the user to adjust annotations as taught by Harmon in the system disclosed by Kourogi et al. The motivation to do so would have been to resolve the problem that occurs when the calculated position of the annotation occludes objects that the user desires to view. Therefore, it would have been obvious to combine Kourogi et al with Harmon to obtain the invention specified in claim 8.

35. **Claims 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kourogi et al in view of Erwin Pang, and Dimitrios Hatzinakos, "An Efficient Implementation of Affine Transformation Using One-Dimensional FFT's," April 1997, Proceedings of 1997 IEEE International Conference on Acoustics, Speech, and Signal Processing, Vol. 4, p. 2885-2888 (herein referred to as "Pang et al").**

36. With regard to claims 9 and 10, Kourogi et al discloses in the first paragraph of section 2.1:

We estimate image alignment parameters between an input frame and a referred panoramic image, by using a fast and robust gradient-based method that can find affine or projective parameters of image alignment between images. We use affine model because of its stability of estimation.

37. Kourogi et al does not expressly disclose "performing interpolation to the annotation display position set in each of the plural actually taken images," or "the interpolation is non-

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linear interpolation” and “from among plural non-linear curves previously held, the non-linear curve is determined based on the annotation position of the object in each of the plural actually taken images,” as recited in claims 9 and 10. Pang et al teaches in the first paragraph of section 1 (*emphasis added*):

Geometrical transformation of digital image is a common application in image processing [1] [2]. The uniformly distributed samples on a two-dimensional plane, after being transformed, will be misaligned with the reference grid pattern which are only defined for discrete locations. An interpolation of these transformed pixels is thus needed to recover those on the grid points.

38. Pang et al further discloses, “Cubic interpolation [11] is more accurate since it uses more neighbouring points for resampling” (*1st paragraph of section 4.1*).

39. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to incorporate non-linear interpolation for determining the annotation position as taught by Pang et al in the system disclosed by Kouroggi et al, and to do so from among plural non-linear curves previously held. The motivation for doing so would have been to “recover the grid points in the image” after the affine transformation is applied, as suggested by Pang et al, in a computationally efficient manner. Therefore, it would have been obvious to combine Pang et al with Kouroggi et al to obtain the invention specified in claims 9 and 10.

Conclusion

40. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Ismo Rakkolainen, Jani Timmerheid, Teija Vainio, “A 3D City Info for Mobile Users,” November 9, 2000, Proceedings of the 3rd International Workshop on Intelligent

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Interactive Assistance and Mobile Multi-Media Computing, p. 115-121 shows a three-dimensional view and a corresponding map view. U.S. Patent No. 6,968,973 to Uyttendaele et al discloses an annotated image-based virtual tour.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason M. Repko whose telephone number is 571-272-8624. The examiner can normally be reached on Monday through Friday 8:30 am -5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ulka Chauhan can be reached on 571-272-7782. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JMR


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